American Healthware Systems

Automated Care Plan System to Lower Healthcare Costs

In 1994, widespread attention throughout the U.S. economy was focused on the need to control healthcare costs. Many healthcare information systems were used to track a wide range of information, from billing to treatment outcomes. However, because the systems were not fully interoperable, the data could not be used to improve patient care. American Healthware Systems sought to help solve this problem. In 1995, the company, teamed with Columbia-Presbyterian Medical Center, was awarded Advanced Technology Program (ATP) cost-shared funding. American Healthware Systems' proposal to ATP outlined a research program to set up an automated system that would electronically provide care plans to practitioners and track their compliance with the plan.

Although the company failed to develop an interface that could prompt physicians to use the care plans in an effective manner, the company continued its research into hospital information systems after the project ended in 1997. Several years later, American Healthware Systems was purchased by a division of Siemens that was also conducting research in hospital information systems separate from the American Healthware Systems products. Commercialization of a Siemens product that incorporates some of the knowledge learned during the ATP-funded project is expected in 2003 or 2004.

COMPOSITE PERFORMANCE SCORE
(based on a four star rating)
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Research and data for Status Report 94-04-0017 were collected during December 2002 - January 2003.

Care Plans that Could Cut Costs Were Not Being Used

The healthcare industry has a pivotal role in the economic health of the United States due to its sheer size and the cost of the services it provides. In 1994, medical spending exceeded $938 billion, and 20 percent of that amount was related to inefficiencies associated with the processing of information. One method used in the mid-1990s to speed the flow of best-practice guidelines to practitioners was paper-based care plans. Hospitals and health systems put care plans in the hands of practitioners and expected them to use the documented best-in-class care practices that similar institutions used to reduce lengths of stay and the cost of care. One study conducted in the mid-1990s at Columbia-Presbyterian Medical Center, a major university hospital in New York, showed that adherence to care plans for a high-volume procedure reduced the length of the hospital stay and the cost of care by 20 percent. Despite these significant, tangible benefits, the rate of best-practice use by physicians remained low because the paper-based plans could not be easily customized for individual patients. In part because of this lack of flexibility, and the inconvenience of referring to a care plan manual before every treatment decision, physicians in the Columbia-Presbyterian Medical Center study eventually stopped using care plans. Consequently, at that point, lengths of stay and the cost of care reverted to their pre-study levels.

Care Plan Automation Could Be Key to Practitioner Buy-In

Medical literature in the mid-1990s touted care plans as the most efficient way to bring best, cost-effective practices to hospitals and health systems. The major

problem was how to convince physicians to accept and adhere to the care plans. American Healthware Systems, a New York City company that was an outsourcing billing center for several New York City hospitals, along with the Columbia-Presbyterian Medical Center's Center of Medical Informatics, proposed to use recent advances in computer technology to develop an automated environment for implementing and monitoring care plans and practice guidelines. The automated environment would allow physicians to tailor the care plans to individual patient needs and would allow hospital administrators to monitor all failures to comply with the care plans.

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To accomplish this, American Healthware Systems proposed to develop an automated Hospital Care Plan System (HCPS), which would encode patient test results and histories along with the care plan. The system could then issue treatment alerts, based on patient-specific data, directly to the physicians' computer screens where they entered the treatment orders. With such a system, physicians would be reminded of the care plans on a continuous and timely basis, and an administrator could question them on a decision to ignore the plan if that decision resulted in an adverse outcome or an increased length of stay. The hope for HCPS was that it would overcome the barriers to using care plans and would allow the healthcare system to realize significant savings from shorter lengths of stay.

ATP Funding Crucial to Company's Research

At the time of its proposal to ATP, American Healthware Systems provided outsourced actuary and billing services for hospitals. A company employee who had a programming background recognized the added costs of not using care plans and developed a broad outline for the HCPS. American Healthware Systems was able to complete a pilot project using HCPS-type architecture to record costs and savings associated with the use of care plans for coronary artery bypass grafts (CABGs). However, the company was not in the software development business, and internal funds could not be used to further develop the system. Furthermore, external funds were not available for full system development. HCPS's potential for cost savings, information sharing, and new avenues for treatment met the criteria for ATP's 1994 “Information Infrastructure for Healthcare” focused program. ATP awarded American Healthware Systems $2 million in cost-shared funds to design a more complete HCPS prototype with the Columbia-Presbyterian Medical Center's study/assessment.

Potential Cost Savings Could Be Significant

Data from the initial study at Columbia-Presbyterian Medical Center showed that an annual potential savings of $5.48 million was possible by using best-practice care plans on just the current load of 548 CABG patients. Much of these savings were anticipated to result from the average projected decrease of four days in the traditional length of stay. However, the study also found that if practitioners were not continually reminded of care plan requirements, after one year they lapsed into old habits that increased the cost of care and the lengths of stay.

Extrapolating this type of cost savings across the healthcare delivery system, it could be possible to reduce overall healthcare costs by nearly 20 percent, saving close to $180 billion annually. Best-practice care plans could also lead to increased productivity because, theoretically, sick employees would return to work faster when treated under care plans.

The Challenge Was To Develop a User-Friendly System

The overarching technical challenge for the American Healthware Systems' project was to develop a system that the doctors would use. Cost savings would only accrue when practitioners followed the plans. With traditional paper or CD-ROM-based plans, practitioners stopped using the plans after about a year because of the constant requirement to refer to a book during treatment.

American Healthware Systems believed that the key to physician adoption of the HCPS was a graphical user

interface (GUI) that would prompt doctors with the next care plan step as they entered their orders in the computer. This would be accomplished by using the Arden Syntax system, a commonly used software system for care plans, that would pipe next steps right onto a healthcare provider's ordering system to prompt a specific action at every step of entering patient orders. To prevent the physicians from merely declining an action every time the reminder came on-screen, American Healthware Systems proposed a back-end database that would record each time a practitioner disregarded the care plan. These data could then be cross-referenced with any adverse outcomes. Administrators would have the ability to monitor care plan compliance and could bring the outcomes to the physicians' attention on a regular basis.

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Administrators would also have the option to integrate the HCPS into the hospital's total quality management system. That way, administrators could focus on gaining practitioner support for using care plans for the most expensive procedures where best practices were likely to result in the most dramatic outcomes. Once physician support for using care plans was gained, administrators could insert additional plans to cover lower cost procedures without encountering resistance.

Even with Solid Design Ideas, HCPS Could Not Be Developed

American Healthware Systems had lofty goals for the HCPS. Unfortunately, because the company was not able to design the system according to the specifications in its ATP proposal, the HCPS did not become a reality. The GUI would not function properly in order to prompt physicians in an effective manner. The database with care plans did not correlate well with patient information and the physician's choice of precise wording of the proposed treatment. Moreover, the back-end database could not record as much data as the company had planned, making a full utilization review impossible.

American Healthware Systems did, however, create an Internet-enabled GUI that could be used in more general applications. At the end of the ATP-funded project in 1997, the company devoted an additional $500,000 of its own money to further the research and development of a user interface. Two years later, Siemens Medical Solutions Health Services Corporation purchased American Healthware Systems (primarily for its outsourced hospital billing expertise). According to American Healthware Systems' President, Harold Fischman, development of the user interface continued at Siemens. Siemens' Eagle Gold Base System, the next generation of American Healthware Systems product offerings, incorporated some of the knowledge gained during the ATP-funded project. Although the software was set to launch in 2002, technical problems delayed commercialization. To date, no revenues have been earned from innovations flowing from the ATP-funded project.

Project Knowledge Is Shared Within the Healthcare Industry

Knowledge gained during the ATP-funded research was shared with Columbia-Presbyterian Medical Center through its relationship as the potential test bed for the American Healthware Systems' program. Knowledge was also shared with Siemens after its purchase of American Healthware Systems.

Conclusion

American Healthware Systems, working with Columbia-Presbyterian Medical Center, responded to ATP's Information Infrastructure for Healthcare focused program by proposing to create an extensive graphical user interface that could link physicians with best-practice care plans and could allow hospital administrators to monitor adherence to care plans and conduct full utilization reviews. Due to programming difficulties, the user interface could not be used to help physicians care for patients by using best-practice care paths. The interface did show promise for other more general applications. This led Columbia-Presbyterian Medical Center and American Healthware Systems to invest an additional $500,000 to further research the interface. Furthermore, Siemens has incorporated some of the knowledge learned from the ATP-funded research into their Eagle Gold Base System software package set for commercialization in 2003 or 2004.

PROJECT HIGHLIGHTS
American Healthware Systems

Project Title: Automated Care Plan System to Lower Healthcare Costs (Automated Care Plans and Practice Guidelines)

Project: To develop an automated Hospital Care Plan System (HCPS) that will issue treatment alerts based on patient-specific data (such as test results and histories) and optimal care rules encoded in the system.

Duration: 1/1/1995-12/31/1997
ATP Number: 94-04-0017

Funding (in thousands):

ATP Final Cost	$1,135	57%
Participant Final Cost	855	43%
Total	$1,990	

Accomplishments: Although American Healthware Systems did not meet all of the technical goals it defined for this ATP-funded project, the company did develop a graphical user interface that could potentially be used in hospital applications that are less complex than the HCPS. Research continued after the 1999 purchase of American Healthware Systems by a division of Siemens. Some knowledge learned from the ATP-funded research has been incorporated in Siemens' Eagle Gold Base System software package that is set for commercialization in 2003 or 2004. The system is an Internet-enabled method of allowing users to communicate with a back-end mainframe in a healthcare setting.

Commercialization Status: Siemens' commercialization of the Eagle Gold Base System, which incorporated information from the ATP project, is planned for 2003 or 2004. No other commercialization is anticipated.

Outlook: Because American Healthware Systems did not achieve all of its technical goals, the outlook for the HCPS is uncertain. Until the Eagle Gold Base System is actually commercialized, the outlook for technology that incorporates knowledge from this ATP-funded project is uncertain.

Composite Performance Score: *

Focused Program: Information Infrastructure for Healthcare, 1994

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